**T03D02 - Periodicity MC Practice**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Directions: Choose the **ONE BEST** answer, and highlight, explaining the answer if not obvious to you.

1. An element has seven valence electrons. That element should be

a. a noble gas b. a transition element

c. an alkaline earth metal d. an alkali metal

e. a halogen

1. Which of the following has the largest first ionization potential (energy)

a. calcium b. strontium

c. barium d. beryllium

e. radium

1. How many electron can be described by the quantum numbers n = 3, l = 3, ml = 0? **HL**

a. 0 b. 2

c. 10 d. 14

e. 18

1. The number of electrons that can be contained in any energy level is given by the expression:

a. (2n)2 b. 2 (n +1)2

c. n2 d. 2n2

e. none of the above are correct

1. In which of the following pairs does the first element have a higher electronegativity than the second?

a. Cl, F b. Al, S

c. S, O d. As, O

e. Na,Cs

1. How many electrons in an atom can have the quantum numbers n = 6, l = 4? **HL**

a. 0 b. 6

c. 10 d. 14

e. 18

1. Which of the following sets of quantum numbers would not be possible for an electron in an atom? **HL**

n l ml ms

a. 1 0 0 +1/2

b. 3 1 -1 -1/2

c. 6 0 0 +1/2

d. 3 1 2 -1/2

e. 2 0 0 +1/2

1. Which of the following atoms or ions has 2 unpaired electrons?

a. N b. O

c. F d. B+3

e. O-2

1. Which pair of elements has the most similar properties?

a. nitrogen and oxygen b. chlorine and sulfur

c. argon and krypton d. calcium and scandium

e. gallium and silicon

10. An element, symbol E, has the electron configuration [Kr]4d105s25p3. The element is a(n)

a. transition element b. nonmetal

c. metal d. lanthanide

e. metalloid

1. In which group do all the elements have the same number of valence electrons?

a. Sb, Ge, Si b. O,S,Te

1. c. Zn, Cu, Ga d. Bi,Sb,C

e. B, Al, P

1. Most elements in the periodic table are:

a. liquids b. gases

c. metalloids d. nonmetals

1. e. metals
2. The atoms of most active nonmetals have

a. small atomic radii, high ionization energies, and high electronegativies

b. small atomic radii, low ionization energies, and high electronegativies

c. large atomic radii, high ionization energies, and high electronegativies

d. large atomic radii, low ionization energies, and high electronegativies

e. small atomic radii, low ionization energies, and low electronegativies

1. As you go from beryllium to radium in Group IIA, the

a. electronegativity increases and the atomic radius increases.

b. electronegativity decreases and the atomic radius increases.

c. electronegativity decreases and the atomic radius decreases.

d. electronegativity remains the same and the atomic radius increases.

e. electronegativity increases, and the atomic radii decreases.

1. Which of the following is not isoelectronic with Ar?

a. Cl-1 b. S-2

c. Al+3 d. Ca+2

e. Sc+3

1. Which of the following ions has the largest atomic radius?

a. Ca+2 b. K+

c. Cl-1 d. S-2

e. P-3

1. An atom of rubidium contains 37 electrons. How many of these electrons are in the s orbitals?

a. 1 b. 2

c. 8 d. 9

e. 10

1. The third energy level can hold a maximum of

a. 8 electrons b. 10 electrons

c. 14 electrons d. 18 electrons

e. 32 electrons

1. As you go from left to right across period 3 of the periodic table there is

a. a decrease in ionization energy.

b. a decrease in metallic characteristics.

c. a decrease in electronegativity.

d. a decrease in the number of valence electrons.

e. a decrease in the size of the ions produced.

**Use the following partial periodic table to answer questions 20-25: [Only representative or main-group elements are shown]**

New 1 2 13 14 15 16 17 18

Old IA IIA IIIA IVA VA VIA VIIA VIII

.

B F C

D E A G H I J K

20. The element (listed) with the smallest atomic radius

a I b. J

` c C d. F

e. H

21. The element which has the highest electron affinity.

a. I b. C

c B d. F

e. J

22. The most non-metallic element [of those listed]

a. B b. C

c. I d. A

e. J

23. When elements A and F react with each other, the compound formed would be

a. A3F2 b. A2F3

c. A2F d. AF2

e. none of these is correct

24. The element with the least reactivity (of those listed)

a I b F

c C d E

e. J

25. The properties of element E would most nearly resemble those of

a. J b. B

c. D d. H

1. e. K

26. How many elements in the second period of the periodic table have one or more unpaired

electrons?

a. 3 b. 4

c. 5 d. 6

1. e. 7
2. Which of the following sublevels is **last** to fill as atomic number increases from 1 to 36?

a. 3d b. 4s

c. 4p d. 4d

e. 4f

1. The least reactive of the Group IIA metals is

a. Be b. Mg

c. Ca d. Sr

e. Ba

1. Metallic character …………across a period and …………….down a group?

a. decreases; increases b. increases; decreases

c. decreases; decreases d. increases; increases

e there is no trend for this property

1. Which of the following is **NOT** a trend going down a group in the periodic table?

a. atomic size increases b. ionization energy decreases

c. metallic character increases d. electron affinity decreases

e. number of outer electron increases

1. How many d orbitals have n = 2?

a. 0 b. 3

c. 5 d. 7

e 1

1. The electron configuration of an element with atomic number 109 should be:

a. [Rn] ] 7s25f146d17p6 b. [Rn] 7s25f146d7

c. [Rn] ] 8s25f146d7 d.[Rn] ] 7s14f146d8

e. [Rn] ] 7s26d7

1. For which of the following elements does the electron configuration for the lowest energy state

show a partially filled d orbital?

a. Ti b. Rb

c. Ga d. Kr

e. Al

1. Consider the following orderings:

I. S<P<Si<Al

II, Be<Mg<Ca<Sr

III. I<Br<Cl<F

IV. Ga<As<Ca<K

Which of these give(s) a correct trend in size?

a. I b. II

c. III d. IV

e. I, II f. I, II, III

1. Which of the following is not considered a periodic trend?

a. ionization energy b. electron affinity

c. atomic radius d. density

e. electronegativity